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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BERNATZ, KEVIN M

ART UNIT

PAPER NUMBER

1773

DATE MAILED: 08/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/990,131

Examiner

Kevin M Bernatz

Applicant(s)

TAKESHITA ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-16 is/are allowed.
- 6) ☒ Claim(s) 1-3, 11 and 12 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 10 June 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____.

DETAILED ACTION

Response to Amendment

1. Amendments to claims 1 – 5 and 11 - 16, filed on June 10, 2003, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on May 28, 1999. It is noted, however, that applicants have not filed a copy of the international application, nor a certified copy of the international application as required by MPEP 1895.01, section 2 should applicants desire to perfect their priority (*"In addition, all other conditions of 35 U.S.C. 120 (such as having at least one common inventor) must be satisfied. A copy of the international application (and an English translation) may be required by the examiner to perfect the claim for benefit under 35 U.S.C. 120 and 365(c) if necessary, for example, where an intervening reference is found and applied in a rejection of one or more claims.."*).

Request for Continued Examination

4. The Request for Continued Examination (RCE) under 37 CFR 1.53 (d) filed on June 10, 2003 is acceptable and a RCE has been established. An action on the RCE follows.

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The Examiner suggests avoiding using *just* the generic designation "Magnetic Recording Medium" since it does not provide adequate distinction from the many prior patents with similar titles.

Drawings

6. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on June 10, 2003 have been accepted. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Double Patenting

7. Applicant is advised that should claim 4 be found allowable, claim 16 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing

one claim to object to the other as being a substantial duplicate of the allowed claim.

See MPEP § 706.03(k).

Claim Objections

8. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

9. Claims 1 – 3, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osami ('843 A) in view of Meyer et al. ('360) and Satoh (U.S. Patent No. 5,820,969), and evidenced by applicants' admissions. See provided Machine Translation of JP '843 A.

Regarding claims 1 and 2, Osami discloses a magnetic memory medium comprising a substrate on which a groove and a land are concentrically formed (*Figures*), a magnetic film deposited on said substrate (*layer 1b*); and a non-magnetic film deposited on said magnetic film and filling said groove to a position higher than the land of the substrate (*layer 12*).

Osami fails to disclose a magnetic disc, or the level difference between the upper surface of the magnetic film on the land (*layer 1b*) and an upper surface of the non-magnetic film filling the groove (*layer 12*).

However, regarding the disclosure of a magnetic disc, the Examiner deems that magnetic tapes, cards and discs are known equivalents in terms of structures of magnetic recording media, as evidenced by Satoh (*col. 1, lines 6 – 10 and col. 2, lines 23 – 26*).

Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, a magnetic tape or card and a magnetic disk are structural equivalents in the field of magnetic recording media. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

Regarding the relative heights of the two upper surfaces, Meyer et al. teach the importance of controlling the surface of the magnetic disc comprising a filling material to possess heights that are approximately equal in order to insure a smooth surface to contact the air-bearing surface of the magnetic head (*Figures 15A – 15C and col. 7, lines 24 - 36*). The Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the relative height difference of the upper surfaces through routine experimentation, especially given the teaching in Meyer et al. regarding the desire to minimize the difference to produce a smooth surface for contacting the air-bearing surface of the magnetic head. *In re Boesch*, 205 USPQ 215 (CCPA 1980); *In re Geisler*, 116 F. 3d 1465, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Aller*, 220 F.2d, 454, 456, 105 USPQ 233, 235 (CCPA 1955).

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Regarding claim 3, Osami discloses that the material for protecting layer 12 comprises a non-magnetic plastic material (*Paragraph 0045*) and it is known in the art to utilize Co alloys as the magnetic films for magnetic discs (*see Satoh – col. 6, lines 47 – 61*). The Examiner deems that it would have been obvious to use a non-magnetic plastic material (max T_m deemed approx. 100 – 200 °C) with a melting point lower than a Co alloy used as the magnetic material, since the Co alloys possess significantly higher melting points (as evidenced by applicants' specification, page 12) and one of ordinary skill would desire to not subject the previously deposited magnetic layer to melting when depositing the protecting layer, since such additional melting would adversely affect the physical and magnetic properties of the layer by affecting the crystal microstructure and the surface morphology.

Regarding claims 11 and 12, Meyer et al. disclose a magnetic disc apparatus meeting applicants' nominal limitations (*Figure 1 and col. 1, lines 37 - 60*). It would have been obvious to one of ordinary skill in the art at the time of applicants' invention to use a magnetic disc apparatus meeting applicants' claimed structural limitations, since these limitations are nominal magnetic recording apparatus limitations required to rotate and read/write from a magnetic disc.

10. Claims 1, 2, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamura et al. (U.S. Patent No. 5,372,843) in view of Meyer et al. ('360).

Regarding claims 1 and 2, Miyamura et al. disclose a magnetic memory disc comprising a substrate on which a groove and a land are concentrically formed (*Figure I(i); col. 1, lines 13 – 15 and 38 – 40; and col. 5, lines 45 - 54*), a magnetic film deposited on said substrate (*layer 5 and 6; and col. 4, line 67 bridging col. 5, line 10*); and a non-magnetic film deposited on said magnetic film and filling said groove to a position higher than the land of the substrate (*col. 5, lines 61 - 64*).

Regarding the limitation “substrate”, the Examiner has given the term the broadest reasonable interpretation in view of the knowledge of one of ordinary skill in the art. Specifically, the Examiner has interpreted the term “substrate” to refer to any layers deposited under the magnetic layer to which the magnetic layer is capable of being deposited on, i.e. layers 1 – 3 in Figure I(i).

Miyamura et al. fail to disclose the level difference between the upper surface of the magnetic film on the land (*layer 6*) and an upper surface of the non-magnetic film filling the groove (*carbon layer over layer 7*).

Regarding the relative heights of the two upper surfaces, Meyer et al. teach the importance of controlling the surface of the magnetic disc comprising a filling material to possess heights that are approximately equal in order to insure a smooth surface to contact the air-bearing surface of the magnetic head (*Figures 15A – 15C and col. 7, lines 24 - 36*). The Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the relative height difference of the upper surfaces through routine experimentation, especially given the teaching in Meyer et al. regarding the desire to

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minimize the difference to produce a smooth surface for contacting the air-bearing surface of the magnetic head.

Regarding claims 11 and 12, Meyer et al. disclose a magnetic disc apparatus meeting applicants' nominal limitations (*Figure 1 and col. 1, lines 37 - 60*). It would have been obvious to one of ordinary skill in the art at the time of applicants' invention to use a magnetic disc apparatus meeting applicants' claimed structural limitations, since these limitations are nominal magnetic recording apparatus limitations required to rotate and read/write from a magnetic disc.

11. Claims 1, 2, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshita et al. (JP 2000-195042 A) in view of Ohta et al. ('357). See U.S. Patent No. 6,583,957 B1, which is the U.S. equivalent of JP '042 A.

Regarding claim 1, Takeshita et al. disclose a magnetic memory disc comprising a substrate on which a groove and a land are concentrically formed (*Figure 9c; col. 1, line 16 and 38 - 40; and col. 2, lines 41 - 43*), a magnetic film deposited on said substrate (*layer 3*); and a non-magnetic film deposited on said magnetic film and filling said groove to a position higher than the land of the substrate (*layer 4*).

Takeshita et al. fail to disclose the level difference between the upper surface of the magnetic film on the land (*layer 3*) and an upper surface of the non-magnetic film filling the groove (*layer 4*) meeting applicants' claimed limitations, though Takeshita et al. disclose that layer 4 is deposited "thick enough to refill the grooves" and that the only

thickness requirement is that a “thin protective film” remains (*col. 5, lines 40 – 67 and col. 6, lines 38 - 40 and 53 – 55*).

However, Ohta et al. teach that a carbon protective/lubricant film for a magnetic disc outer surface can be formed at a thickness values as small as 2 nm.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Takeshita et al. to use only enough carbon to fill the grooves while leaving an ~2 nm “thin protective layer” as taught by Ohta et al. since such a layer would still protect the recording medium and use the least amount of material during production..

Regarding claim 2, the limitation(s) “substantially equal”, the Examiner has given the term(s) the broadest reasonable interpretation(s) in view of the knowledge of one of ordinary skill in the art at the time of applicants' invention. Specifically, the Examiner has interpreted the term “substantially equal” to mean within 2 – 3 nm of each other, based on applicants' disclosure (pages 19, 20 and 22).

Regarding claims 11 and 12, Takahashi et al. disclose a magnetic disc apparatus meeting applicants' nominal limitations (*Figure 2 and col. 4, lines 5 - 15*). It would have been obvious to one of ordinary skill in the art at the time of applicants' invention to use a magnetic disc apparatus meeting applicants' claimed structural limitations, since these limitations are nominal magnetic recording apparatus limitations required to rotate and read/write from a magnetic disc.

Allowable Subject Matter

12. The following is a statement of reasons for the indication of allowable subject matter: regarding claims 4 and 13 – 16, while the prior art disclose magnetic recording disks possessing a land and groove structure wherein a non-magnetic material is deposited above the magnetic layer, the prior art fails to teach or render obvious a magnetic disk meeting applicants' claimed structural limitations in combination with a non-magnetic material including at least Te.

Response to Arguments

13. The rejection of claims 1 – 5, 11 and 12 under 35 U.S.C § 112 – 1st

Paragraph

The above noted rejection has been withdrawn because applicant(s) amendment(s) have removed the rejected subject matter (e.g. the negative limitation “non-optical” was removed).

14. The rejection of claims 1 and 3 under 35 U.S.C § 102(a) – Koichi

The rejection of claim 11 under 35 U.S.C § 103(a) – Koichi in view of Ohta et al.

Applicants' arguments have been considered but are moot in view of the new ground(s) of rejection.

The above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations (e.g. “wherein a level difference ... is 5 nm

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or less") no longer anticipated, nor rendered obvious, by the above noted rejection. The Examiner notes that Koichi possesses a structure similar to applicants' in that Figure 1 discloses that the height of the upper surface of the non-magnetic material in the groove (*element 5*) is only different than the upper surface of the magnetic material on the land (*element 3*) by the thickness of the carbon protective layer (*element 4*), which is known to be formed down to thickness values of 2 nm or less (see *Ohta et al.*). However, since the grooves in Koichi are designed to hold lubricant, the Examiner deems one would have been motivated to make the protecting layer (*element 4*) thick (i.e. a thickness > 5 nm) so that even more lubricant could be held. The Examiner notes that Koichi only discloses a thickness of 30 nm as the thickness of layer 4 (*examples*).

15. The rejection of claims 1 – 3, 5, 11 and 12 under 35 U.S.C § 102(b) – Ohta et al.

Applicants' arguments have been considered but are moot in view of the new ground(s) of rejection.


The above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations (e.g. "and filling said groove" and "wherein a level difference ... is 5 nm or less") no longer anticipated, nor rendered obvious, by the above noted rejection.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (703) 308-1737. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.



Kevin M. Bernatz
Patent Examiner

July 29, 2003